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BLACKLEG

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DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
BULLETIN No. 117—NEW SERIES

HEALTH OF ANIMALS BRANCH
GEO. HILTON, V.S., Veterinary Director General

630.4
C212
B 117
n.s.
1929
c. 3

Published by direction of the Hon. R. Weir, Minister of Agriculture,
Ottawa, 1930

Acc. No.

CLASS MK.

PUB.

DATE REC'D.

MAY 4 - 1931

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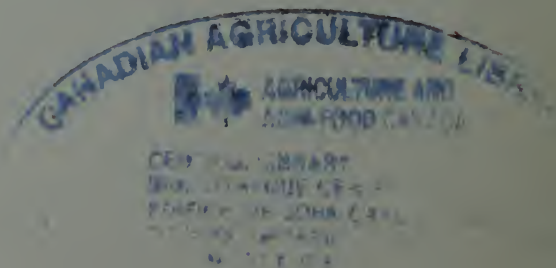
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BLACKLEG

Blackleg is a rapidly fatal enzootic disease of young cattle characterized by the development of a swelling in the tissues under the skin and in the muscles. The swelling contains gas bubbles and gives a crackling sound if handled, while the skin frequently feels like dried parchment. The disease is caused by a specific organism or germ.

It is supposed that Blackleg has existed for hundreds of years, but it was not until 1878 that the organism causing the disease was discovered and it was two years later that its principal characters were determined and studied. The germ causing the disease grows only in the absence of air (oxygen). It also forms spores or resting bodies which are very resistant and may live for many years. These spores correspond to the seeds of the higher plants. Their resistance is readily understood when it is remembered that grains of wheat may be left exposed to all weathers, including frost, for two or three years and eventually germinate if placed in suitable soil.

Blackleg is seen almost exclusively among cattle. Sheep, goats and swine may contract the disease but human beings, horses, dogs, cats and poultry appear to be immune. Cattle between the ages of six months and two years are most susceptible. The disease is seldom seen in calves under six months and in cattle over two years and very rarely in those over four years of age.

This disease occurs in all stock countries but is restricted more or less to definite localities. In some places blackleg may break out year after year. Outbreaks usually occur sporadically and generally cattle contract the disease from infected pastures. The germs are found in the soil of infected localities and the disease may be produced by placing material containing the specific organisms under the skin of a susceptible animal. It is assumed that cattle become infected naturally through wounds in the skin, mouth or intestines. Wounds may be caused by barbed wire, thorns or sharp pointed particles of food. Infection might also gain entrance through the exposed gums when young cattle are getting their permanent teeth.

Blackleg is not governed by regulations as stockowners can take preventive measures by having their young cattle inoculated against the disease.

Some years ago vaccines were manufactured and sold by the Department of Agriculture. This work was undertaken to encourage stockowners to vaccinate their cattle against Blackleg and judging from the large amounts of vaccine used these efforts have been successful. The making of Blackleg vaccine by the department has been discontinued as it is no longer necessary. A number of reliable products such as *Blackleg Aggressin* and *Blackleg Filtrate* are now manufactured by commercial institutions and can be purchased through local agencies, veterinarians and druggists. These newer products are replacing the Blackleg vaccine in the form of pellets and threads. The Department of Agriculture is satisfied that an ample supply of these products, reliable and efficient in affording protection, is now available to the public through the ordinary commercial channels. Hyperimmune serum or blackleg anti-serum is also obtainable. This anti-serum gives an immediate passive immunity of short duration which may be useful when Blackleg has already broken out.

The symptoms of Blackleg usually begin from one to three days after infection has taken place. The general symptoms are like those of any other acute febrile disease. There is loss of appetite, the animal appears dull and has a high temperature, up to 107° F. Local symptoms are the swelling, which is usually pronounced, and the lameness and stiffness caused by it. The swell-

ing may occur anywhere on the body except below the knees and on the tail. Its usual location is on the thighs, shoulders, neck or lower region of the chest. The swelling contains gas which is one of the products of the germ and this accounts for the crackling sound when the swelling is pressed. At first small and painful the swelling rapidly extends and this is accompanied by laboured breathing and increasing weakness. Sometimes convulsions occur before death, which is the usual termination of the disease.

When the characteristic swelling of Blackleg is found the *carcass should not be opened* but should if possible be burned on the spot where it is found. The germs while not numerous in the blood are present in great numbers in the bloody serum of the swelling. The swelling should therefore be left uncut otherwise the surrounding ground may be contaminated and cause trouble in future years.

If no swelling is noticed and a post-mortem is held blood spots may be seen on the heart and lungs and the liver may be congested. Blood stained fluid is often present in the chest and abdominal cavities and the internal lining of the intestines may be reddened or blood-stained. The blood appears normal and clots readily when exposed to the air.

If the swelling of Blackleg is opened it will be found to extend deeply into the muscle. It is brownish to almost black with a frothy serum which is caused by the gas bubbles coming up to the surface. A peculiar penetrating acid odour, somewhat like rancid butter, is noticeable when the swelling is cut.

It is sometimes necessary to distinguish Blackleg from other diseases such as Anthrax, Malignant Oedema and Haemorrhagic Septicaemia. If any of these diseases have been diagnosed definitely the carcass should be burned or buried whole just as in Blackleg.

In Anthrax the blood is tarry and does not clot and the spleen is very much enlarged. The germs causing Anthrax are always present in the blood in large numbers and it is extremely dangerous to hold a post-mortem examination on an animal with this disease as Anthrax is very fatal to man.

The swelling of malignant Oedema also contains gas and is somewhat similar to that of Blackleg. It is usually associated with a large wound or it may follow surgical operations.

Haemorrhagic Septicaemia may occur in cattle of all ages and if a swelling is present it is usually at the throat or dewlap or at the lower portion of the legs. These swellings are soft and doughy.

When doubt exists as to the cause of death and Blackleg or Anthrax is suspected a specimen may be forwarded to a laboratory for examination. A few drops of blood in an equal amount of glycerine placed in a vial or a few drops of blood on a sheet of clean notepaper and allowed to dry will enable a diagnosis to be made. The vial containing the blood must be marked *Dangerous suspected Blackleg or Anthrax*, and securely packed in another container together with the sender's name and address and a history of the case. Blood dried on notepaper must be enclosed in an envelope and marked in the same manner and then wrapped and placed in another envelope with name, etc., and mailed to the laboratory.

These precautions are necessary, due to the danger to human beings handling Anthrax specimens.

In checking the spread of the disease it is important to remove the apparently healthy animals to another pasture if this is possible. The complete removal of the animals from an infected place may check an outbreak. The sick animals should be confined in a small pasture. If the carcasses cannot be burned they should be buried deeply and covered with lime as soon as possible. The skin should never be removed and animals or birds should be

prevented from feeding upon the carcasses. The ground where the animal lay should be disinfected and covered with lime. Land on which animals have contracted the disease should not be used for pasture if this can be avoided unless the animals have been vaccinated.

An opportunity for treatment is seldom afforded and when such an opportunity presents itself it is usually fruitless, although recoveries from Blackleg may occasionally take place.

Preventive inoculation is widely practised, especially in districts where outbreaks have previously occurred. The vaccine formerly used is now seldom manufactured as it has been ascertained that the living attenuated organisms are not necessary to produce an active immunity. It is the so-called aggressins which are present in the vaccine which are responsible for the immunity. These aggressins can now be obtained with the attenuated germs entirely removed so that it is not possible for a pure aggressin to produce the disease in any circumstances.

While the results following the administration of aggressins are quite satisfactory, it must be borne in mind that these products will not prevent death in an animal already infected with Blackleg. Aggressins require a few days to produce immunity, after which the inoculated animal will resist exposure to the disease for a long period.

During the few days following the injection of aggressins before active immunity is established, however, an animal's resistance may be lowered. It is for this reason that a Blackleg anti-serum is sometimes used in herds when the disease is already present. These Blackleg serums or hyperimmune serums produce an immediate passive immunity which may prevent the development of the disease in animals actually infected and also prevent infection in healthy animals. As this immunity only lasts for a comparatively short period it would be advisable to inoculate with aggressins or vaccines in the usual way before allowing cattle to return to an infected pasture.

When heavy losses are occurring the Blackleg anti-serum and the aggressin or vaccine may be injected at the same time with beneficial results.

In districts where Blackleg is indigenous the proper procedure is to inoculate all young cattle, six months and over, in the spring before they are turned out to pasture. Young calves at pasture should be inoculated when they reach the age of six months. In badly infected districts young cattle should be inoculated against Blackleg both in the spring and in the fall.

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